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(54) **IMPROVED SECURITY DATA ENTRY ALPHANUMERIC KEYPAD**

CONFIDENTIAL DISCLOSURE

Date: October 15, 1997

TITLE: IMPROVED SECURITY DATA ENTRY ALPHANUMERIC KEYPAD

To: Commissioner of Patents
     Canada Intellectual Property Office
     50 Vistoria Street
     Ottawa, Hull
     Canada
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Background

The following is an idea that I believe is a unique solution to a problem
that many people will find valuable. I have drafted a description of the
problem, my idea for a solution and one example of how the idea could be
implemented. There are many different ways that the idea could be
implemented.

The idea has been disclosed in confidence to only one other person, Tom
Boyd (a registered patent agent). I met with Tom Boyd (CBSC) on October 1,
and he did a preliminary search of prior art and did not find my idea. To
date we have check abst/keypad, and ccl/235/379 and have not found my
idea.

1.0 Subject

1.1 Alphanumeric keypads have become a critical source for delivering
     secret security information to computers around the world. Whether
     it is a phone calling card ID, the PIN number for your banking
     machine or debit card, or a building security code, the success of each
     system depends on the maintaining the secrecy of the security code
     number. These keypad secured systems are protecting many millions
     of dollars worth of assets around the world.

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1.2 It has been my experience that because all of these security systems share a common, and well-known key positioning on the keypad, it is possible to ascertain the PIN or security code by observing someone enter their code without actually seeing the keys. Therefore, there is an opportunity to improve the security code entry device.

2.0 The Invention

2.1 An alphanumeric keypad that reorganizes the position of the letters and/or numbers after every use. For visually impaired users there could be a selectable standard key position option. Depending on the key design and packaging (with or without a polarized lens, with or without concave keys), it would be virtually impossible to determine the security code based on the positions selected on the keypad even when observed from very close proximity.

3.0 Preferred Practice

3.1 This keypad would be a niche product targeted to satisfy the need for enhanced security at the security code entry device. The obvious customers for the product being Bank ATM and debit system manufacturers and security system manufacturers.

4.0 Distinguishing Features

4.1 The main distinguishing feature is that the location that is pressed on the keypad has no relationship to the actual letter and/or number that the user is selecting. A polarized lens or concave faceplate or key design over LED keys (or LCD) would restrict the field of visibility to a very narrow band immediately (or display) in front of the user.

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5.0 Possible Implementations

5.1 Implementation #1 (Figure #1 attached)

Component#1: Ten electronic single digit displays with the ten displays arranged into a rectangular array like a conventional keypad. This could also be a small touch sensitive display or a new technology.

Component#2: A touch sensitive/transparent/polarized membrane that lays over the ten electronic displays (all packaged in a suitable case). The membrane would permit the user to see the keypad numbers and make the correct selection by pressing the membrane. By using a polarized material, the numbers would only be visible within a very narrow window in front of the display. The same result could be achieved by using an arrangement of transparent concave keys.

Component#3: A microchip controller that can generate the random key (letter and/or number) positions and drive the ten single digit display units, determine which number corresponds to the membrane (key) touch position and relay the security code to the system computer.
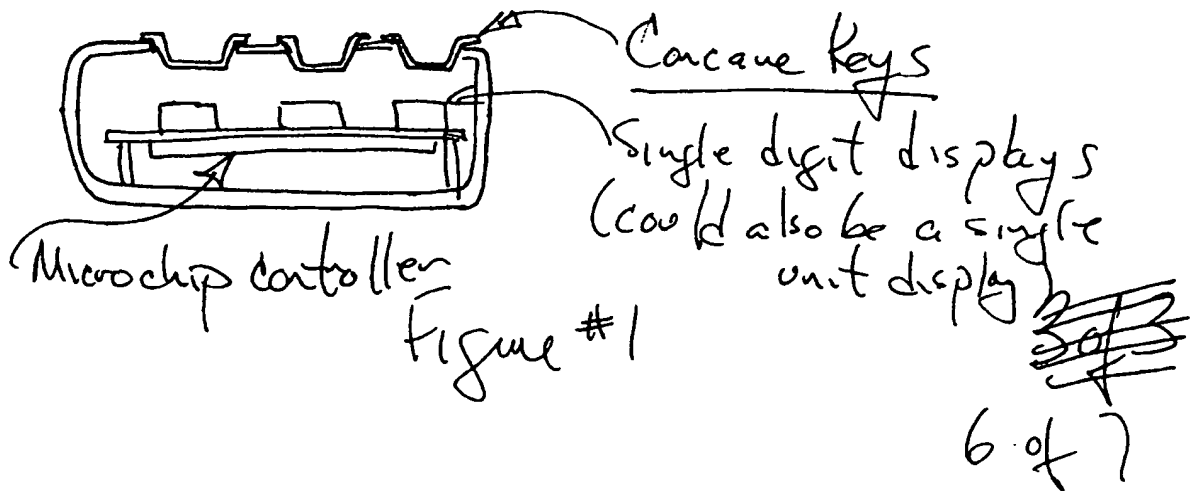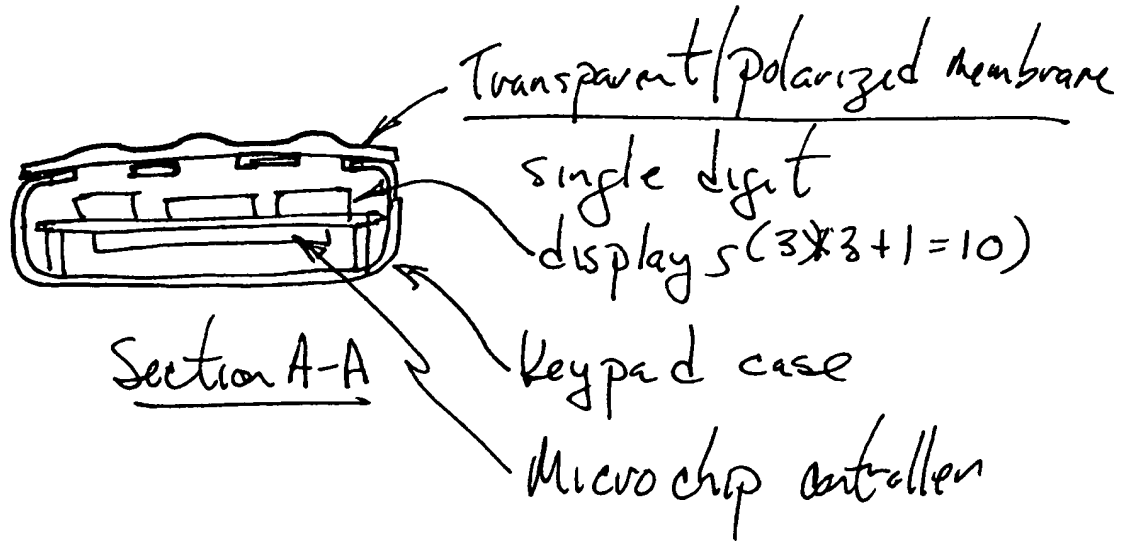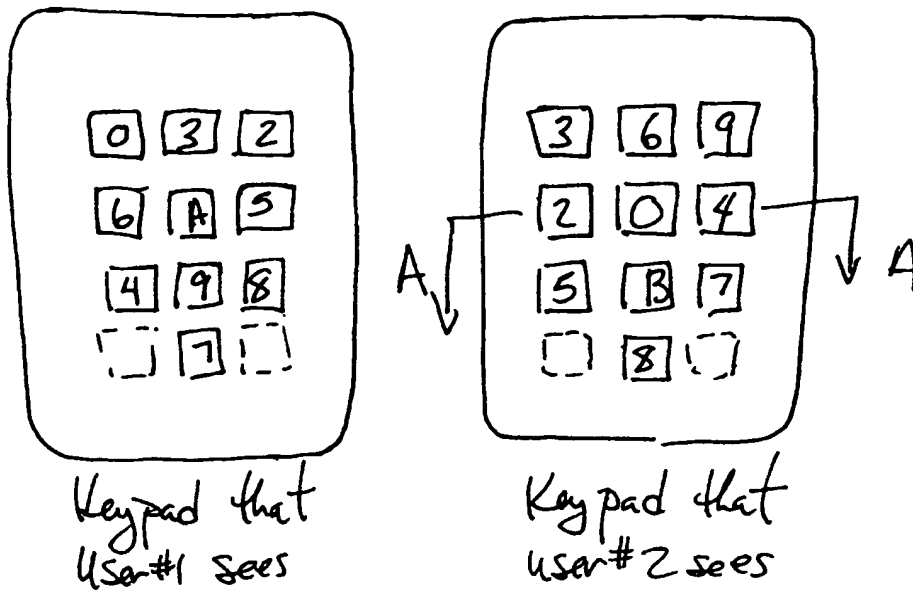
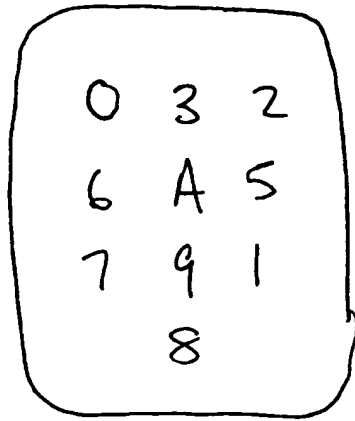5.2 Implementation #2 (Figure #2 attached)

Component#1: A single display unit that can display the complete set of key positions and alphanumeric assignments.

Component#2: A touch sensitive/transparent/polarized membrane that lays over the single unit display. By using a polarized material, the numbers would only be visible within a very narrow window in front of the display. The touch sensitive surface and the polarized membrane may be separate components or an integral part of the display unit.
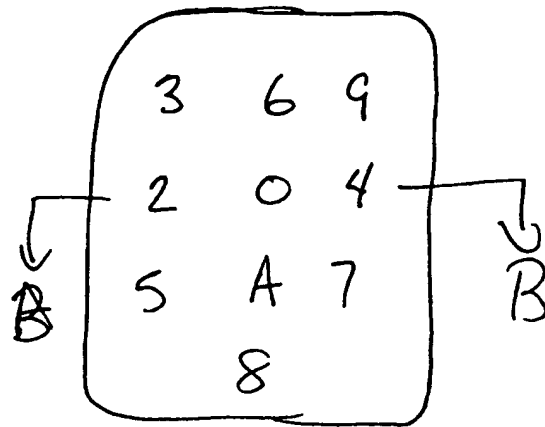
Component#3: A microchip controller that can generate the random key (letter and/or number) positions and drive the single display unit, determine which number corresponds to the membrane (key) touch position and relay the security code to the system computer.

5.3 Note that both implementations #1 and #2 could be part of a larger assembly and need not be stand alone data entry devices. For example if the invention was part of an ATM, the keypad could be part of the ATM structural assembly and therefore would not require the keypad case. Also, the single display touch sensitive display unit capability (Impl #2) could be added to an existing computer display unit at an ATM possibly without the use of additional hardware.
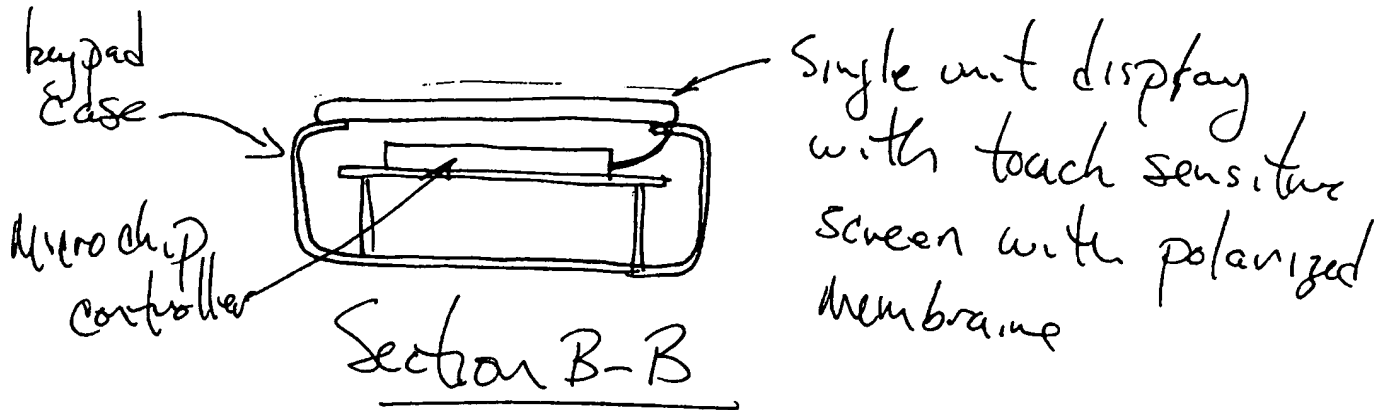
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Keypad that
User #1 sees

Keypad that
user #2 sees

A

A

Transparent/Polarized membrane

single digit
displays (3*3+1=10)

Section A-A

Keypad case

Microchip controller

Concave Keys

Single digit displays
(could also be a single
unit display

Microchip controller

Figure #1

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Keypad for
User #1

Key pad for
User #2

keypad
case

Micro chip
Controller

Section B-B

Single unit display
with touch sensitive
screen with polarized
membrane

Figure #2

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